

## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	106	"SAX parser"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 13:38
S2	0	"SAX parser"and stor\$3 same hierarch\$4 near document\$1 same relationa adj database\$1	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 13:39
S3	0	"SAX parser"and stor\$3 same hierarch\$4 near document\$1 and relationa adj database\$1	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 13:40
S4	0	"SAX parser"and hierarch\$4 near document\$1 and relationa adj database\$1	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 13:40
S5	0	"SAX parser"and stor\$3 same document\$1 and hierarch\$4 and relationa adj database\$1	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 13:40
S6	0	"SAX parser" and stor\$3 same document\$1 and hierarch\$4 and relationa adj database\$1	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 13:40
S7	0	"SAX parser" and document\$1 and hierarch\$4 and relationa adj database\$1	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 13:41
S8	14	S1 and hierarch\$3 and ("relational database" or "relational databases")	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 13:42
S9	4	S1 and hierarch\$3 and ("relational database" or "relational databases") and @ad<"20021030"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 14:14
S10	2	"6990632".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 14:17
S11	3	"200182133"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 14:17
S12	1	"6366299".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:25

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S13	1	"6418446".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:25
S14	1	"6476833".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:31
S15	1	"6480860".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:32
S16	1	"6480865".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:33
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S18	1	"6502101".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:34
S19	1	"6502112".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:34
S20	1	"6631497".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:35
S21	1	"6868423".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:35
S22	1	"20020099738".PN.	US-PGPUB	OR	ON	2006/05/15 14:35
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S26	1	"20040054675".PN.	US-PGPUB	OR	ON	2006/05/15 14:36
S27	1	"6418446".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:36
S28	2	"6418446".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 14:37
S30	1	S28 and pars\$3 and document\$1 and hierarch\$4 and stor\$3 and node\$1 and (identifier\$1 or ID!)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2006/05/15 14:39
S31	1	"6286010".PN.	USPAT; USOCR	OR	ON	2006/05/15 14:48


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# 1 [Research sessions: XML I: Storing and querying ordered XML using a relational database system](#)



Igor Tatarinov, Stratis D. Viglas, Kevin Beyer, Jayavel Shanmugasundaram, Eugene Shekita, Chun Zhang

 June 2002 **Proceedings of the 2002 ACM SIGMOD international conference on Management of data SIGMOD '02**

Publisher: ACM Press

 Full text available: [pdf\(1.38 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

XML is quickly becoming the *de facto* standard for data exchange over the Internet. This is creating a new set of data management requirements involving XML, such as the need to store and query XML documents. Researchers have proposed using relational database systems to satisfy these requirements by devising ways to "shred" XML documents into relations, and translate XML queries into SQL queries over these relations. However, a key issue with such an approach, which has largely been ignored ...

## 2 [Efficiently publishing relational data as XML documents](#)

Jayavel Shanmugasundaram, Eugene Shekita, Rimón Barr, Michael Carey, Bruce Lindsay, Hamid Pirahesh, Berthold Reinwald

 September 2001 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 10 Issue 2-3

Publisher: Springer-Verlag New York, Inc.

 Full text available: [pdf\(216.67 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

XML is rapidly emerging as a standard for exchanging business data on the World Wide Web. For the foreseeable future, however, most business data will continue to be stored in relational database systems. Consequently, if XML is to fulfill its potential, some mechanism is needed to publish relational data as XML documents. Towards that goal, one of the major challenges is finding a way to efficiently structure and tag data from one or more tables as a hierarchical XML document. Different alternatives ...

**Keywords:** Publishing, Relational databases, XML

## 3 [Storing HyTime documents in an object-oriented databases](#)

 Klemens Böhm, Karl Aberer  
November 1994

**Proceedings of the third international conference on Information and knowledge management****Publisher:** ACM PressFull text available: [pdf\(1.03 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

An open hypermedia-document storage system has to meet requirements that are not satisfied by existing systems: it has to support non-generic hypermedia document types, i.e. document types enriched with application-specific semantics. It has to provide hypermedia-document access methods. Finally, it has to allow the exchange of hypermedia documents with other systems. On a technical level, an object-oriented database-management system, on a logical level, a well established ISO standard, na ...

**4 Web Information Management: A performance evaluation of storing XML data in relational database management systems**

Latifur Khan, Yan Rao

November 2001 **Proceedings of the 3rd international workshop on Web information and data management****Publisher:** ACM PressFull text available: [pdf\(104.45 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

XML is an emerging standard for the representation and exchange of Internet data. Along with document type definition (DTD), XML permits the execution of a collection of queries, using XPath to identify data in XML documents. In this paper we examine how XML data can be stored and queried using a standard relational database management system (RDBMS). For this, we propose a technique for automatic mapping from an XML document to relations within the RDBMS. We demonstrate that our novel approach ...

**Keywords:** DTD, SQL, XML, XPath, relational DBMS**5 Database and digital library technologies: Bulkloading and maintaining XML documents**

Albrecht Schmidt, Martin Kersten

March 2002 **Proceedings of the 2002 ACM symposium on Applied computing****Publisher:** ACM PressFull text available: [pdf\(555.23 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The popularity of XML as a exchange and storage format brings about massive amounts of documents to be stored, maintained and analyzed --- a challenge that traditionally has been tackled with Database Management Systems (DBMS). To open up the content of XML documents to analysis with declarative query languages, efficient bulk loading techniques are necessary. Database technology has traditionally been offering support for these tasks but yet falls short of providing efficient automation techniqu ...

**Keywords:** XML, document databases, document warehouses, maintenance, relational databases**6 XML data management and web discovery: Exploiting native XML indexing techniques for XML retrieval in relational database systems**

Felix Weigel, Klaus U. Schulz, Holger Meuss

November 2005 **Proceedings of the 7th annual ACM international workshop on Web information and data management WIDM '05****Publisher:** ACM PressFull text available: [pdf\(569.93 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In XML retrieval, two distinct approaches have been established and pursued without much cross-fertilization taking place so far. On the one hand, *native XML databases* tailored to the semistructured data model have received considerable attention, and a wealth of index structures, join algorithms, tree encodings and query rewriting techniques for XML have been proposed. On the other hand, the question how to make XML fit the relational data model has been studied in great detail, giving r ...

**Keywords:** CADG, RCADG, RDBMS, RDBS, Relational CADG, XML indexing, XML retrieval, content-aware dataGuide, query evaluation, relational database, storage scheme

## 7 An analysis of XML database solutions for the management of MPEG-7 media descriptions



Utz Westermann, Wolfgang Klas

December 2003 **ACM Computing Surveys (CSUR)**, Volume 35 Issue 4

**Publisher:** ACM Press

Full text available: [pdf\(448.76 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

MPEG-7 constitutes a promising standard for the description of multimedia content. It can be expected that a lot of applications based on MPEG-7 media descriptions will be set up in the near future. Therefore, means for the adequate management of large amounts of MPEG-7-compliant media descriptions are certainly desirable. Essentially, MPEG-7 media descriptions are XML documents following media description schemes defined with a variant of XML Schema. Thus, it is reasonable to investigate curren ...

**Keywords:** MPEG-7, XML database systems, multimedia databases

## 8 XML and text: XRank: ranked keyword search over XML documents



Lin Guo, Feng Shao, Chavdar Botev, Jayavel Shanmugasundaram

June 2003 **Proceedings of the 2003 ACM SIGMOD international conference on Management of data**

**Publisher:** ACM Press

Full text available: [pdf\(265.38 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We consider the problem of efficiently producing ranked results for keyword search queries over hyperlinked XML documents. Evaluating keyword search queries over hierarchical XML documents, as opposed to (conceptually) flat HTML documents, introduces many new challenges. First, XML keyword search queries do not always return entire documents, but can return deeply nested XML elements that contain the desired keywords. Second, the nested structure of XML implies that the notion of ranking is no ...

## 9 Sensor databases: Cache-and-query for wide area sensor databases



Amol Deshpande, Suman Nath, Phillip B. Gibbons, Srinivasan Seshan

June 2003 **Proceedings of the 2003 ACM SIGMOD international conference on Management of data**

**Publisher:** ACM Press

Full text available: [pdf\(230.75 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Webcams, microphones, pressure gauges and other sensors provide exciting new opportunities for querying and monitoring the physical world. In this paper we focus on querying *wide area sensor databases*, containing (XML) data derived from sensors spread over tens to thousands of miles. We present the first scalable system for executing XPATH

queries on such databases. The system maintains the logical view of the data as a single XML document, while physically the data is fragmented across a ...

10 An XML query engine for network-bound data

Zachary G. Ives, A. Y. Halevy, D. S. Weld

December 2002 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 11 Issue 4

**Publisher:** Springer-Verlag New York, Inc.

Full text available:  [pdf\(351.86 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

XML has become the lingua franca for data exchange and integration across administrative and enterprise boundaries. Nearly all data providers are adding XML import or export capabilities, and standard XML Schemas and DTDs are being promoted for all types of data sharing. The ubiquity of XML has removed one of the major obstacles to integrating data from widely disparate sources - namely, the heterogeneity of data formats. However, general-purpose integration of data across the wide are a also re ...

**Keywords:** Data integration, Data streams, Query processing, Web and databases, XML

11 Conflict scheduling of transactions on XML documents

Stijn Dekeyser, Jan Hidders

January 2004 **Proceedings of the fifteenth conference on Australasian database - Volume 27 CRPIT '04**

**Publisher:** Australian Computer Society, Inc.

Full text available:  [pdf\(305.86 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

In the last few years an interest in native XML databases has surfaced. With other authors we argue that such databases need their own provisions for concurrency control since traditional methods are inadequate to capture the complicated update-behavior that is possible for XML documents. Ideally, updates should not be limited to entire document trees, but should involve subtrees and even individual elements. Providing a suitable scheduling algorithm for semistructured data can significantly imp ...

**Keywords:** XML, concurrency control, conflict scheduler, path locks, semistructured data, serializability, transaction model

12 TIMBER: A native XML database

H. V. Jagadish, S. Al-Khalifa, A. Chapman, L. V. S. Lakshmanan, A. Nierman, S. Paparizos, J. M. Patel, D. Srivastava, N. Wiwatwattana, Y. Wu, C. Yu

December 2002 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 11 Issue 4

**Publisher:** Springer-Verlag New York, Inc.

Full text available:  [pdf\(268.39 KB\)](#) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

This paper describes the overall design and architecture of the Timber XML database system currently being implemented at the University of Michigan. The system is based upon a bulk algebra for manipulating trees, and natively stores XML. New access methods have been developed to evaluate queries in the XML context, and new cost estimation and query optimization techniques have also been developed. We present performance numbers to support some of our design decisions. We believe that the key in ...

**Keywords:** Algebra, Document management, Hierarchical, Query processing, Semi-structured

### 13 Special section on advanced XML data processing: On database theory and XML



Dan Suciu

September 2001 **ACM SIGMOD Record**, Volume 30 Issue 3

**Publisher:** ACM Press

Full text available: [pdf\(745.69 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Over the years, the connection between database theory and database practice has weakened. We argue here that the new challenges posed by XML and its applications are strengthening this connection today. We illustrate three examples of theoretical problems arising from XML applications, based on our own research.

### 14 Storing text retrieval systems on CD-ROM: compression and encryption considerations



Shmuel T. Klein, Abraham Bookstein, Scott Deerwester

July 1989 **ACM Transactions on Information Systems (TOIS)**, Volume 7 Issue 3

**Publisher:** ACM Press

Full text available: [pdf\(1.53 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The emergence of the CD-ROM as a storage medium for full-text databases raises the question of the maximum size database that can be contained by this medium. As an example, the problem of storing the Trésor de la Langue Française on a CD-ROM is examined in this paper. The text alone of this database is 700 megabytes long, more than a CD-ROM can hold. In addition, the dictionary and concordance needed to access these data must be stored. A further constraint is that some of the ...

### 15 Efficient passage ranking for document databases



Marcin Kaszkiel, Justin Zobel, Ron Sacks-Davis

October 1999 **ACM Transactions on Information Systems (TOIS)**, Volume 17 Issue 4

**Publisher:** ACM Press

Full text available: [pdf\(328.98 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Queries to text collections are resolved by ranking the documents in the collection and returning the highest-scoring documents to the user. An alternative retrieval method is to rank passages, that is, short fragments of documents, a strategy that can improve effectiveness and identify relevant material in documents that are too large for users to consider as a whole. However, ranking of passages can considerably increase retrieval costs. In this article we explore alternative query evaluation ...

**Keywords:** inverted files, passage retrieval, query evaluation, text databases, text retrieval

### 16 Special section on advanced XML data processing: Why and how to benchmark XML databases



Albrecht Schmidt, Florian Waas, Martin Kersten, Daniela Florescu, Michael J. Carey, Ioana Manolescu, Ralph Busse

September 2001 **ACM SIGMOD Record**, Volume 30 Issue 3

**Publisher:** ACM Press

Full text available: [pdf\(612.38 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Benchmarks belong to the very standard repertory of tools deployed in database development. Assessing the capabilities of a system, analyzing actual and potential bottlenecks, and, naturally, comparing the pros and cons of different systems

architectures have become indispensable tasks as databases management systems grow in complexity and capacity. In the course of the development of XML databases the need for a benchmark framework has become more and more evident: a great many different ways t ...

17 Research papers: storage, indexing, and system architecture: System RX: one part relational, one part XML



Kevin Beyer, Roberta J. Cochrane, Vanja Josifovski, Jim Kleewein, George Lapis, Guy Lohman, Bob Lyle, Fatma Özcan, Hamid Pirahesh, Normen Seemann, Tuong Truong, Bert Van der Linden, Brian Vickery, Chun Zhang

June 2005 **Proceedings of the 2005 ACM SIGMOD international conference on Management of data**

**Publisher:** ACM Press

Full text available: pdf(426.08 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

This paper describes the overall architecture and design aspects of a hybrid relational and XML database system called System RX. We believe that such a system is fundamental in the evolution of enterprise data management solutions: XML and relational data will co-exist and complement each other in enterprise solutions. Furthermore, a successful XML repository requires much of the same infrastructure that already exists in a relational database management system. Finally, XML query languages hav ...

18 A normal form for XML documents



Marcelo Arenas, Leonid Libkin

March 2004 **ACM Transactions on Database Systems (TODS)**, Volume 29 Issue 1

**Publisher:** ACM Press

Full text available: pdf(439.02 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This article takes a first step towards the design and normalization theory for XML documents. We show that, like relational databases, XML documents may contain redundant information, and may be prone to update anomalies. Furthermore, such problems are caused by certain functional dependencies among paths in the document. Our goal is to find a way of converting an arbitrary DTD into a well-designed one, that avoids these problems. We first introduce the concept of a functional dependency for XM ...

**Keywords:** DTDs, XML data, design, functional dependencies, normal form

19 XAS: a system for accessing componentized, virtual XML documents

Ming-Ling Lo, Shyh-Kwei Chen, Sriram Padmanabhan, Jen-Yao Chung

July 2001 **Proceedings of the 23rd International Conference on Software Engineering**

**Publisher:** IEEE Computer Society

Full text available: pdf(143.39 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)



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*XML is emerging as an important format for describing the schema of documents and data to facilitate integration of applications in a variety of industry domains. An important issue that naturally arises is the requirement to generate, store and access XML documents.*

*It is important to reuse existing data management systems and repositories for this purpose. In this paper, we describe the XML Access Server (XAS), a general purpose XML based storage and retrieval system which ...*

20 Information access and retrieval: A structured documents retrieval method supporting



**attribute-based structure information**

Seung-Kyu Ko, Yoon-Chul Choy

March 2002 **Proceedings of the 2002 ACM symposium on Applied computing****Publisher:** ACM PressFull text available: pdf(631.74 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

There are many studies on retrieval methods for structured documents but most of the studies are for those whose structure information is expressed by elements. But when elements are used to describe a document structure, the structure becomes static and difficult to expand. So describing a document structure using attributes is used in many standards. But most of the existing systems support mainly element-based structured documents and do not consider attribute-based ones. Hence they do not su ...

**Keywords:** information retrieval, structure attribute, structured document

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# 1 [Research sessions: XML I: Storing and querying ordered XML using a relational database system](#)



Igor Tatarinov, Stratis D. Viglas, Kevin Beyer, Jayavel Shanmugasundaram, Eugene Shekita, Chun Zhang

 June 2002 **Proceedings of the 2002 ACM SIGMOD international conference on Management of data SIGMOD '02**

Publisher: ACM Press

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XML is quickly becoming the *de facto* standard for data exchange over the Internet. This is creating a new set of data management requirements involving XML, such as the need to store and query XML documents. Researchers have proposed using relational database systems to satisfy these requirements by devising ways to "shred" XML documents into relations, and translate XML queries into SQL queries over these relations. However, a key issue with such an approach, which has largely been ignored ...

# 2 [XML data modeling and storage: XVerter: querying XML data with OR-DBMS](#)



Humberto Vieira, Gabriela Ruberg, Marta Mattoso

 November 2003 **Proceedings of the 5th ACM international workshop on Web information and data management**

Publisher: ACM Press

Full text available: pdf(277.96 KB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Storage techniques and queries over XML databases are being widely studied. Most works store XML documents in traditional DBMSs in order to take advantage of a well established technology and also to store both structured data and XML data within a single system. This work proposes a translation mechanism to execute queries expressed on XQuery on top of XML documents that are stored in an object DBMS using the DOM implementation in disk. Rules for automatic translation from XQuery to SQL3 are provided ...

**Keywords:** DOM, SQL3, XML, XQuery, XSLT, object DBMS

# 3 [XML indexing and compression: XPRESS: a queriable compression for XML data](#)



Jun-Ki Min, Myung-Jae Park, Chin-Wan Chung

 June 2003 **Proceedings of the 2003 ACM SIGMOD international conference on Management of data**

**Publisher:** ACM Press

Full text available:  [pdf\(277.17 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Like HTML, many XML documents are resident on native file systems. Since XML data is irregular and verbose, the disk space and the network bandwidth are wasted. To overcome the verbosity problem, the research on compressors for XML data has been conducted. However, some XML compressors do not support querying compressed data, while other XML compressors which support querying compressed data blindly encode tags and data values using predefined encoding methods. Thus, the query performance on com ...

#### 4 XML data management and web discovery: Exploiting native XML indexing techniques for XML retrieval in relational database systems



Felix Weigel, Klaus U. Schulz, Holger Meuss

November 2005 **Proceedings of the 7th annual ACM international workshop on Web information and data management WIDM '05**

**Publisher:** ACM Press

Full text available:  [pdf\(569.93 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In XML retrieval, two distinct approaches have been established and pursued without much cross-fertilization taking place so far. On the one hand, *native XML databases* tailored to the semistructured data model have received considerable attention, and a wealth of index structures, join algorithms, tree encodings and query rewriting techniques for XML have been proposed. On the other hand, the question how to make XML fit the relational data model has been studied in great detail, giving r ...

**Keywords:** CADG, RCADG, RDBMS, RDBS, Relational CADG, XML indexing, XML retrieval, content-aware dataGuide, query evaluation, relational database, storage scheme

#### 5 Research session: integration and mapping #1: Designing information-preserving mapping schemes for XML

Denilson Barbosa, Juliana Freire, Alberto O. Mendelzon

August 2005 **Proceedings of the 31st international conference on Very large data bases VLDB '05**

**Publisher:** VLDB Endowment

Full text available:  [pdf\(343.75 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

An XML-to-relational mapping scheme consists of a procedure for *shredding* documents into relational databases, a procedure for *publishing* databases back as documents, and a set of constraints the databases must satisfy. In previous work, we defined two notions of information preservation for mapping schemes: *losslessness*, which guarantees that any document can be reconstructed from its corresponding database; and *validation*, which requires every legal database to corr ...


#### 6 Database technology: XQuery speedup using replication in mapping XML into relations



Jaehoon Kim, Seog Park

March 2003 **Proceedings of the 2003 ACM symposium on Applied computing**

**Publisher:** ACM Press

Full text available:  [pdf\(793.45 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#)

In this paper, we introduce some replication methods that reduce the query cost incurred when reconfiguring XML documents from divided XML data. The fundamental idea is that query performance can be enhanced by analyzing query patterns and replicating data essential for the query performance. Several practical and effective replication methods

are formulated. A translation process in which XQuery is rewritten into SQL using this replication information is performed by a heuristic method, which s ...

### 7 HydroJ: object-oriented pattern matching for evolvable distributed systems



Keunwoo Lee, Anthony LaMarca, Craig Chambers

October 2003 **ACM SIGPLAN Notices , Proceedings of the 18th annual ACM SIGPLAN conference on Object-oriented programing, systems, languages, and applications OOPSLA '03**, Volume 38 Issue 11

Publisher: ACM Press

Full text available: [pdf\(311.06 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In an evolving software system, components must be able to change independently while remaining compatible with their peers. One obstacle to independent evolution is the *brittle parameter problem*: the ability of two components to communicate can depend on a number of *inessential* details of the types, structure, and/or contents of the values communicated. If these details change, then the components can no longer communicate, even if the *essential* parts of the message remain ...

**Keywords:** HydroJ, XML, distributed systems, dynamic dispatch, object-oriented programming, pattern matching, semi-structured data, software evolution, ubiquitous computing

### 8 XML and text: XRank: ranked keyword search over XML documents



Lin Guo, Feng Shao, Chavdar Botev, Jayavel Shanmugasundaram

June 2003 **Proceedings of the 2003 ACM SIGMOD international conference on Management of data**

Publisher: ACM Press

Full text available: [pdf\(265.38 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We consider the problem of efficiently producing ranked results for keyword search queries over hyperlinked XML documents. Evaluating keyword search queries over hierarchical XML documents, as opposed to (conceptually) flat HTML documents, introduces many new challenges. First, XML keyword search queries do not always return entire documents, but can return deeply nested XML elements that contain the desired keywords. Second, the nested structure of XML implies that the notion of ranking is no ...

### 9 Industrial sessions: the marriage of XML and relational databases: ORDPATHs: insert-friendly XML node labels



Patrick O'Neil, Elizabeth O'Neil, Shankar Pal, Istvan Cseri, Gideon Schaller, Nigel Westbury

June 2004 **Proceedings of the 2004 ACM SIGMOD international conference on Management of data**

Publisher: ACM Press

Full text available: [pdf\(101.14 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

We introduce a hierarchical labeling scheme called ORDPATH that is implemented in the upcoming version of Microsoft® SQL Server™. ORDPATH labels nodes of an XML tree without requiring a schema (the most general case---a schema simplifies the problem). An example of an ORDPATH value display format is "1.5.3.9.1". A compressed binary representation of ORDPATH provides document order by simple byte-by-byte comparison and ancestry relationship equally simply. In addition, the ORDPATH schem ...

### 10 DB-6 (databases): XML query processing: Efficient processing of XML twig patterns with parent child edges: a look-ahead approach


-  Jiaheng Lu, Ting Chen, Tok Wang Ling  
November 2004 **Proceedings of the thirteenth ACM international conference on Information and knowledge management CIKM '04**

**Publisher:** ACM Press

Full text available:  [pdf\(222.65 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

With the growing importance of semi-structure data in information exchange, much research has been done to provide an effective mechanism to match a twig query in an XML database. A number of algorithms have been proposed recently to process a twig query holistically. Those algorithms are quite efficient for queries with only ancestor-descendant edges. But for queries with mixed ancestor-descendant and parent-child edges, the previous approaches still may produce large intermediate results, ev ...

**Keywords:** XML, holistic twig pattern matching

- 11 [Research papers: XML query, update, and search: Lazy XML updates: laziness as a virtue, of update and structural join efficiency](#) 


Barbara Catania, Beng Chin Ooi, Wenqiang Wang, Xiaoling Wang

June 2005 **Proceedings of the 2005 ACM SIGMOD international conference on Management of data**

**Publisher:** ACM Press

Full text available:  [pdf\(392.87 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

XML documents are normally stored as plain text files. Hence, the natural and most convenient way to update XML documents is to simply edit the text files. But efficient query evaluation algorithms require XML documents to be indexed. Every element is given a unique identifier based on its location in the document or its preorder-traversal order, and this identifier is later used as (part of) the key in the index. Reassigning orders of possibly a large number of elements is therefore necessary w ...

- 12 [Storing a collection of polygons using quadrees](#) 

Hanan Samet, Robert E. Webber

July 1985 **ACM Transactions on Graphics (TOG)**, Volume 4 Issue 3

**Publisher:** ACM Press

Full text available:  [pdf\(3.00 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

An adaptation of the quadtree data structure that represents polygonal maps (i.e., collections of polygons, possibly containing holes) is described in a manner that is also useful for the manipulation of arbitrary collections of straight line segments. The goal is to store these maps without the loss of information that results from digitization, and to obtain a worst-case execution time that is not overly sensitive to the positioning of the map. A regular decomposition variant of the region ...


**Keywords:** geographic information, hierarchical data structures, line representations, map overlay, polygonal representations, quadrees

- 13 [Storing and querying XML data using denormalized relational databases](#) 

Andrey Balmin, Yannis Papakonstantinou

March 2005 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 14 Issue 1

**Publisher:** Springer-Verlag New York, Inc.

Full text available:  [pdf\(397.97 KB\)](#) Additional Information: [full citation](#), [abstract](#)

XML database systems emerge as a result of the acceptance of the XML data model.

Recent works have followed the promising approach of building XML database management systems on underlying RDBMS's. Achieving query processing performance reduces to two questions: (i) How should the XML data be decomposed into data that are stored in the RDBMS? (ii) How should the XML query be translated into an efficient plan that sends one or more SQL queries to the underlying RDBMS and combines the data ...

#### 14 Storing text retrieval systems on CD-ROM: compression and encryption




##### considerations

Shmuel T. Klein, Abraham Bookstein, Scott Deerwester

July 1989 **ACM Transactions on Information Systems (TOIS)**, Volume 7 Issue 3

**Publisher:** ACM Press


Full text available:  [pdf\(1.53 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The emergence of the CD-ROM as a storage medium for full-text databases raises the question of the maximum size database that can be contained by this medium. As an example, the problem of storing the Trésor de la Langue Française on a CD-ROM is examined in this paper. The text alone of this database is 700 megabytes long, more than a CD-ROM can hold. In addition, the dictionary and concordance needed to access these data must be stored. A further constraint is that some of the ...

#### 15 Storing a Sparse Table with $O(1)$ Worst Case Access Time



 Michael L. Fredman, János Komlós, Endre Szemerédi

June 1984 **Journal of the ACM (JACM)**, Volume 31 Issue 3

**Publisher:** ACM Press

Full text available:  [pdf\(356.39 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#), [review](#)

#### 16 Storing text retrieval systems on CD-ROM: compression and encryption



##### considerations

S. T. Klein, A. Bookstein, S. Deerwester

May 1989 **ACM SIGIR Forum , Proceedings of the 12th annual international ACM SIGIR conference on Research and development in information retrieval SIGIR '89**, Volume 23 Issue SI

**Publisher:** ACM Press

Full text available:  [pdf\(940.61 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)


#### 17 Storing semistructured data with STORED



 Alin Deutsch, Mary Fernandez, Dan Suciu

June 1999 **ACM SIGMOD Record , Proceedings of the 1999 ACM SIGMOD international conference on Management of data SIGMOD '99**, Volume 28 Issue 2

**Publisher:** ACM Press

Full text available:  [pdf\(1.58 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Systems for managing and querying semistructured-data sources often store data in proprietary object repositories or in a tagged-text format. We describe a technique that can use relational database management systems to store and manage semistructured data. Our technique relies on a mapping between the semistructured data model and the relational data model, expressed in a query language called STORED. When a semistructured data instance is given, a STORED mapping can be generated automati ...

Storing and retrieving software components: a refinement based system

A. Mili, R. Mili, R. Mittermeir

May 1994 **Proceedings of the 16th international conference on Software engineering**

Publisher: IEEE Computer Society Press

Full text available:  [pdf\(1.09 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#)19 Storing MDBS catalog information in an X.500 directory service

Patrick Martin, Wendy Powley

October 1994 **Proceedings of the 1994 conference of the Centre for Advanced Studies on Collaborative research**

Publisher: IBM Press

Full text available:  [pdf\(548.45 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The CORDS Multidatabase System (MDBS) provides applications with an integrated view of a collection of distributed heterogeneous data sources. Applications are presented with a relational view of the available data and are able to access the data using standard SQL operations. The information needed by the MDBS to provide its services is kept in an internal database called the MDBS Catalog. This paper describes how the EAN X.500 directory service was used as a storage facility for the MDBS Catalog ...

20 Storing and searching a multikey table

Amos Fiat, Moni Naor, Alexandro Schäffer, Jeanette Schmidt, Alan Siegel

January 1988 **Proceedings of the twentieth annual ACM symposium on Theory of computing**

Publisher: ACM Press

Full text available:  [pdf\(819.30 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We describe an implicit data structure for  $n$  multikey records that supports searching for a record, under any key, in the asymptotically optimal search time  $O(\log n)$ . This improves on [Mun87] in which Munro describes an implicit data structure for the problem of storing  $n$   $k$ -key records so that search on any key can be performed in  $O(\log k \log n)$  ...

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